

Research Article

Knowledge and Food Hygiene Practices among Food Handlers in Saifai Developmental Block of District Etawah: A Cross-Sectional Study

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DOI: <https://doi.org/10.24321/2455.9199.202201>

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How to cite this article:

Bajpai S, Kumar S, Pathak P, Chauhan M, Jain PK, Singh NP. Knowledge and Food Hygiene Practices among Food Handlers in Saifai Developmental Block of District Etawah: A Cross-Sectional Study. Int J HealthCare Edu & Med Inform. 2022;9(1&2):1-8.

Date of Submission: 2022-02-17

Date of Acceptance: 2022-04-23

A B S T R A C T

Background: Food safety knowledge (FSK) is the understanding of food learned from skills or schooling while food safety attitude (FSA) refers to sensation or belief about food safety, and food safety practice refers (FSP) to the act or use of food safety. In the absence of well-maintained and proper food handling practices in mass catering establishments, they have the potential to impart a disastrous effect on human health. This study was conducted with the aim to assess the knowledge and food hygiene practices among food handlers deployed in various food establishments in Saifai developmental block, Etawah district, Uttar Pradesh.

Material and Methods: This cross-sectional study was conducted among all (109) the food handlers above 15 years age working at all the food establishments registered or unregistered with district administration in Saifai developmental block of district Etawah from September 2020-October 2020.

Results: Out of 76 eligible participants, 62 (81.5%) were males as compared to females 14 (18.5%). Majority of the food handlers 36 (47.3%) were aware that disease transmission was through contaminated water followed by contaminated hands (34.2%). 68 (89.4%). Responses of males and females on various questions related to food safety practices were found to be statistically significant ($p < 0.05$) which shows a difference in knowledge of same question in males and females.

Conclusion: Food-handlers in the study area had satisfactory knowledge related to food safety, general and personal hygiene, cleaning and sanitation procedures. However, this did not translate into strict food hygiene practices. Routine medical examination of food handlers must be carried by health officers.

Keywords: Food Safety, Knowledge, Food Safety Practices, Food Handler

Introduction

Food safety knowledge (FSK) is the understanding of food learned from skills or schooling while food safety attitude (FSA) refers to sensation or belief about food safety, and food safety practice refers (FSP) to the act or use of food safety.¹ A report by the World Health Organization (WHO, 2015) showed that about two million incurable cases of food poisoning materialize annually in unindustrialized nations. The WHO further estimated that 600 million food-borne diseases each year were related to poor food safety and hygiene practice with 420,000 deaths.²

Food handler is defined as a person in food trade or someone who, in his routine work, comes into direct contact with food in the course of production, processing, packaging or distribution.³ WHO has estimated that in developed countries, upto 30% of the population suffer from food borne diseases each year whereas 2 million deaths are estimated per year.² Food poisoning occurs as a result of consuming food contaminated with microorganisms or their toxins, the contamination arising from inadequate preservation methods, unhygienic handling practices, cross-contamination from food contact surfaces, or from persons harbouring the microorganisms in their nares and on the skin.⁴ Seventy percent of cases of diarrhoeal diseases are associated with the consumption of contaminated food.⁵ Food safety continues as a critical problem in developed and developing nations for people, food companies and food control officials.⁶ Good personal hygiene and food handling practices are important for preventing the transmission of pathogens from food handlers to the consumers.⁷ Studies have revealed that lack of basic sanitary facilities/infrastructures, poor knowledge and practice of hygiene and sanitation among food handlers in food service establishments and negligence in safe food handling are major reasons of poor food safety practice in food establishments.⁸ The risk factors such as inappropriate time interval, unsuitable temperature, inappropriate weather conditions, unhygienic activities, unacceptable handling of foods, foodstuff from insecure origins, impoverished self-cleanliness, improper cleaning of cooking materials, using untreated water, and improper food storages have been frequently attributed to the causes of FBD's.⁹ Studies have revealed that 12 to 18% of food-borne illnesses are attributable to contaminations, poor food safety, and inappropriate hygiene practices which are accredited to street-cooked food handlers.^{10,11}

This study was conducted with the aim to assess the knowledge and food hygiene practices among food handlers deployed in various food establishments in Saifai community developmental block located in rural setting of Etawah district of Uttar Pradesh.

Material and Methods

A community based cross-sectional study was conducted among the food handlers working at all the food establishments registered or unregistered with district administration in Saifai developmental block of district Etawah. Food handlers who were below 15 years of age were excluded from the study. A total of 16 food establishments were functionally operating in the study area and on approaching all of them sequentially, in all, 109 food handlers were found to be delivering services in various capacities. This study was conducted during a period of two month (September, 2020-October, 2020). Out of 109 food handlers, 24 food handlers were below 15 years of age and 9 did not provide their consent to participate in the study. So, 76 food handlers were interviewed for this study. A pre designed, pretested, structured questionnaire was used to collect the information regarding their socio-demographic profile and knowledge regarding food hygiene. They were also enquired about their food safety practices currently adopted by them regarding food borne illness and its prevention. Their responses were taken in the form of dichotomous responses namely adequate or inadequate and yes or no. All the information thus collected was scrutinized for completeness and entered into Microsoft Excel Spreadsheet and subsequently analysed using IBM SPSS statistics software version 24.0. The descriptive findings has been presented as frequency distribution tables with proportions while the analytical findings have been statistically tested using Chi square test.

Results

Out of 76 eligible study participants, 62(81.5%) were males as compared to females 14 (18.5%). Most 24 (31.5%) of them belonged to middle aged (45-54 years) followed by 21 (27.6%) youngster (25-34) years of age and only 6% participants belonged to less than 25 years. Nearly half of the study population belong to lower socio-economic status as per the modified B.G. Prasad classification. It was also observed that 38 (50%) of them had the habit of smoking while 16 (21%) used alcohol (Figure 1). Regarding knowledge about disease transmission majority 36 (47.3%) responded for contaminated water followed by contaminated hands 26 (34.2%) (Figure 2). For awareness regarding prevention of transmission of disease, majority responded for washing hands after defecation 38 (50%) followed by washing food 14 (18.4%) while some of the food handlers, 13 (17.1%) had the opinion that prevention of disease transmission can be achieved by washing hands before serving (Figure 3). Their main source for information regarding disease transmission and prevention was from various health related posters mounted at health facilities and at various places for health related education (Table 1) (Figure 4).

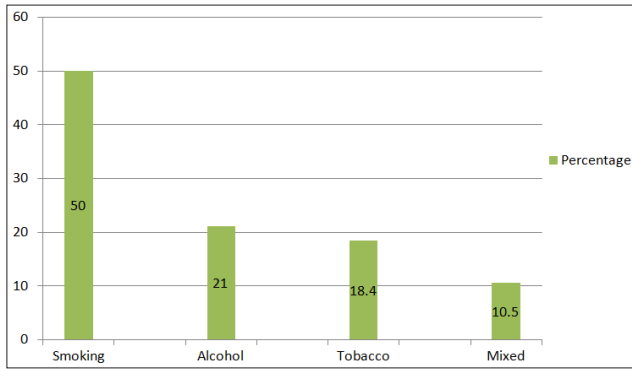


Figure 1. Substance Abuse

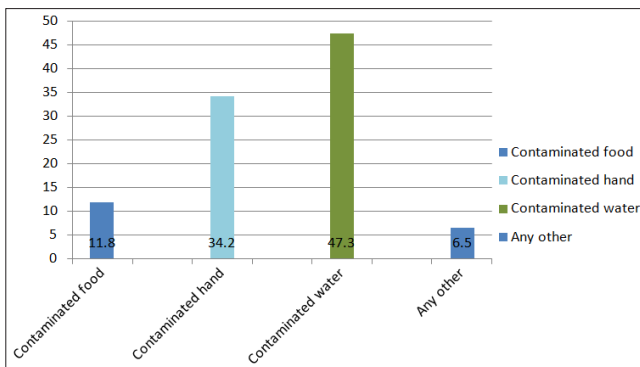


Figure 2. Awareness Regarding Disease Transmission

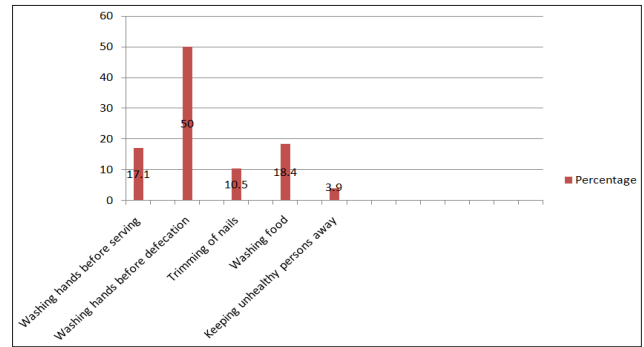


Figure 3. Awareness regarding Prevention of Disease Transmission

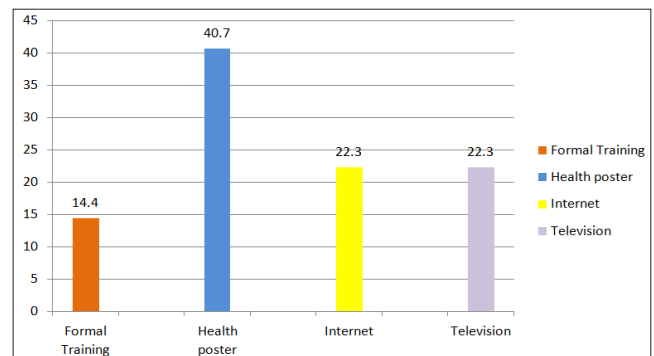


Figure 4. Source of Information

Table 1. Distribution of Study Subjects according to Socio-demographic Profile

(N = 76)

S. No.	Social factors	Variables	Frequency	Percentage
1.	Gender	Male	62	81.5%
		Female	14	18.5%
2.	Age (in years)	15-24	05	6.0%
		25-34	21	27.6%
		35-44	18	23.6%
		45-54	24	31.5%
		≥ 55-64	08	10.5%
	(Mean ±SD)	36.5 ± 10		
3.	Socio-economic status (Modified BG Prasad's classification)	Upper class	0	0%
		Upper middle	16	21.0%
		Lower middle	23	30.2%
		Upper lower	29	38.1%
		Lower class	08	10.5%

Table 2 explains the gender wise association of adequacy of knowledge status about food hygiene among the study subjects. Various questions related to etiology, mode of transmission, preventive measures for food-borne diseases and personal food hygiene revealed that the females had relatively higher proportion of knowledge as compared to males. For some questions like 'clean is the same as

'sanitized' and 'eating and drinking at the work place increase the risk of food contamination' it was observed that the males had more adequate proportion of knowledge than females. It was also observed that for questions 9, 12, 13, 14 and 17 most of the participants had inadequate knowledge. But this difference in knowledge was not found to be statistically significant ($P > 0.05$) (Table 2).

Table 2. Gender Wise Knowledge Status about Food Hygiene among Study Subjects

(N = 76)

S. No	Statements	Knowledge status	Male (N=62) n (%)	Female (N=14) n (%)	Total n (%)	Statistical interpretation (Chi-square test)
1.	Salmonella is among the food borne pathogens	Adequate	4 (6.4)	1 (7.1)	5 (6.5)	P = 0.93
		Inadequate	58 (93.5)	13 (92.8)	71 (93.5)	
2.	Hepatitis A virus is among the food borne pathogens	Adequate	1 (1.6)	0 (0.0)	1 (1.3)	P = 0.63
		Inadequate	61 (98.3)	14 (100)	75 (98.7)	
3.	Swollen cans may contain the microorganism, clostridium botulinum which causes botulism	Adequate	2 (3.2)	0 (0.0)	2 (2.6)	P = 0.50
		Inadequate	60 (96.7)	14 (100)	74 (97.4)	
4.	Microbes are on the skin, in the nose and mouth of healthy food handlers	Adequate	57 (91.9)	13 (92.8)	70 (92.1)	P = 0.91
		Inadequate	5 (8.0)	1 (16.7)	6 (7.9)	
5.	Contaminated foods always have some change in colour, odour or taste	Adequate	46 (74.1)	12 (85.7)	59 (77.6)	P = 0.36
		Inadequate	16 (25.8)	2 (14.2)	17 (22.4)	
6.	Children, healthy adults, pregnant women and older individuals are at equal risk for food poisoning	Adequate	36 (58.0)	10 (71.4)	46 (60.5)	P = 0.36
		Inadequate	26 (41.9)	4 (28.5)	30 (39.5)	
7.	Eating and drinking at the work place increase the risk of food contamination	Adequate	11 (17.7)	1 (7.1)	6 (7.8)	P = 0.33
		Inadequate	51 (82.2)	13 (92.2)	64 (84.2)	
8.	Typhoid fever can be transmitted by food	Adequate	53 (85.4)	12 (85.7)	65 (85.5)	P = 0.98
		Inadequate	9 (14.5)	2 (14.2)	11 (14.4)	
9.	Reheating cooked foods can contribute to food contamination	Adequate	6 (9.6)	1 (7.1)	7 (9.2)	P = 0.77
		Inadequate	56 (90.3)	13 (92.8)	69 (90.7)	
10.	AIDS can be transmitted by food	Adequate	3 (4.8)	0 (0.0)	3 (3.9)	P = 0.40
		Inadequate	59 (95.1)	14 (100)	73 (96.1)	

11.	Bloody diarrhoea can be transmitted by food	Adequate	44 (70.9)	12 (85.7)	56 (73.6)	P = 0.26
		Inadequate	18 (29.0)	2 (14.2)	20 (26.4)	
12.	Cross contamination is when microorganisms from a contaminated food are transferred by the food handler's hands or kitchen utensils to another food	Adequate	3 (100.0)	0 (0.0)	3 (3.9)	P = 0.40
		Inadequate	59 (95.1)	14 (100)	73 (96.1)	
13.	Proper cleaning and sanitization of the utensils decreases the risk of food contamination	Adequate	4 (6.5)	1 (7.1)	5 (6.5)	P = 0.93
		Inadequate	58 (93.5)	13 (92.9)	64 (84.2)	
14.	Food prepared in advance reduces the risk of food contamination	Adequate	5 (8.0)	1 (7.1)	6 (7.8)	P = 0.33
		Inadequate	57 (91.9)	13 (92.8)	64 (84.2)	
15.	Washing utensils with detergent leaves them free of contamination	Adequate	57 (91.9)	13 (92.8)	70 (92.1)	P = 0.91
		Inadequate	5 (8.0)	1 (7.1)	6 (7.8)	
16.	Clean is the same as sanitized	Adequate	50 (80.6)	12 (19.4)	62 (81.5)	P = 0.66
		Inadequate	12 (85.7)	2 (14.3)	14 (18.5)	
17.	Correct temperature for storing perishable foods is 5°C	Adequate	4 (6.4)	1 (7.1)	5 (6.5)	P = 0.93
		Inadequate	58 (93.5)	13 (92.8)	71 (93.5)	
18.	Hot, ready to eat food should be kept at a temperature of 65°C	Adequate	48 (77.4)	12 (85.7)	60 (78.9)	P = 0.49
		Inadequate	14 (22.5)	2 (14.2)	16 (13.1)	
19.	Freezing kills all the bacteria that may cause food borne illness	Adequate	47 (75.8)	12 (85.7)	57 (75.0)	P = 0.42
		Inadequate	15 (24.1)	2 (14.2)	19 (25.0)	
20.	Raw vegetables are at higher risk of contamination than undercooked beef	Adequate	41 (66.1)	11 (78.5)	52 (68.4)	P = 0.37
		Inadequate	21 (33.8)	3 (21.4)	24 (31.6)	
21.	Ideal place to store raw meat in the refrigerator is on the bottom shelf	Adequate	45 (72.5)	12 (85.7)	57 (75.0)	P = 0.31
		Inadequate	17 (27.4)	2 (14.2)	19 (25.0)	

22.	During infectious disease of the skin, it is necessary to take leave from work	Adequate	55 (88.7)	12 (85.7)	67 (88.1)	P = 0.75
		Inadequate	7 (11.2)	2 (14.2)	9 (11.9)	
23.	Health status of workers should be evaluated before employment	Adequate	52 (83.8)	12 (85.7)	64 (84.2)	P = 0.86
		Inadequate	10 (16.1)	2 (14.2)	12 (15.8)	
24.	Washing hands before work reduces the risk of food contamination	Adequate	57 (91.9)	14 (100.0)	71 (93.5)	P = 0.27
		Inadequate	5 (8.1)	0 (0.0)	5 (6.5)	
25.	Using gloves while handling food reduces the risk of food contamination	Adequate	35 (56.5)	9 (64.3)	44 (57.0)	P = 0.59
		Inadequate	27 (43.5)	5 (33.7)	32 (42.1)	

Gender wise food safety practices among food handlers showed that 59 (77.6%) of food handlers do not wear gloves during the distribution of unpackaged foods but 71 (93.4%) food handlers wash their hands before or after using gloves. Also, it was observed that 42 (55.2%) food handlers have the inadequate food safety practices regarding wearing

apron while working. Similarly, 68 (89.4%) food handlers eat or drink at their working places. The difference in the responses of males and females on various questions related to food safety practices were not found to be statistically significant ($p > 0.05$) (Table 3).

Table 3. Gender Wise Food Safety Practices among Food Handlers

(N = 76)

S. No.	Statements	Status of Practices	Male (N=62) n (%)	Female (N=14) n (%)	Total n (%)	Statistical interpretation (Chi-square test)
1.	Do you wash your hands properly before or after using gloves?	Adequate	58 (93.5)	13 (92.8)	71 (93.4)	P = 0.93
		Inadequate	4 (6.4)	1 (7.1)	5 (6.5)	
2.	Do you wear an apron while working?	Adequate	29 (46.7)	5 (35.7)	34 (44.7)	P = 0.45
		Inadequate	33 (53.2)	9 (64.2)	42 (55.2)	
3.	Do you eat or drink at your work place?	Adequate	55 (88.7)	13 (92.8)	68 (89.4)	P = 0.65
		Inadequate	7 (11.2)	1 (7.1)	8 (10.5)	
4.	Do you use gloves during the distribution of unpackaged foods?	Adequate	15 (24.2)	2 (14.3)	17 (22.3)	P = 0.42
		Inadequate	47 (75.8)	12 (85.7)	59 (77.6)	
5.	Do you prepare a meal in advance (from one shift to another)?	Adequate	46 (74.1)	12 (85.7)	59 (77.6)	P = 0.36
		Inadequate	16 (25.8)	2 (14.2)	18 (23.6)	

6.	Do you properly clean the food storage area before storing new products?	Adequate	52 (83.8)	12 (85.7)	64 (84.2)	P = 0.86
		Inadequate	10 (16.1)	2 (14.2)	12 (15.7)	
7.	Do you use the sanitizer when washing service utensils (plates, mugs and spoons)?	Adequate	9 (14.5)	1 (7.1)	10 (13.1)	P = 0.46
		Inadequate	53 (85.4)	13 (92.8)	66 (86.8)	
8.	Do you use the sanitizer when washing fruits and vegetables?	Adequate	10 (16.1)	1 (7.1)	11 (14.4)	P = 0.39
		Inadequate	52 (83.8)	13 (92.8)	65 (85.5)	
9.	Do you check the shelf life of foods at the time of delivery?	Adequate	18 (29.0)	3 (21.4)	21 (27.6)	P = 0.57
		Inadequate	44 (70.9)	11 (78.5)	55 (72.3)	

Discussion

In the present study majority of the study participants were males (81.5%) and 80% of them were aged above 25 years of age while child labor was found among 6% of the study participants. These socio-demographic findings are in accordance with those reported by Takalkar AA and Kumawat AP et al.⁸ in their studies.

The main source of information regarding food borne diseases was from health related posters displayed at various settings. The mean age of the food handlers was 36.5±10 years while Zain MM and Naing NN⁹ had reported mean age to be 41 ± 12 years with range of 14 to 70 years.

The knowledge regarding etiology of food contamination was found to be adequate for questions related to presence of microbes on skin (92.1%), change of color in contaminated food (77.6%) and food poisoning (60.5%) respectively while the average score of the study participants who answered correctly for the questions related to etiology of food borne diseases was 76%. Fortune A et al.¹⁴ reported comparatively lower proportion of awareness among their study participants.

It was also observed that the food handlers were not aware that Salmonella, Hepatitis A virus and Clostridium botulinum in swollen cans could be the potential sources of food borne infections.

For questions about modes of diseases transmission (Questions 7 to 12, Table 2) the average score was 75% which is in accordance with the findings reported by Fortune et al.¹⁴ Although majority of food handlers were aware regarding the transmission of disease through unhygienic practices of food, Typhoid fever and bloody diarrhoea but their knowledge was found to be inadequate on questions

related to eating and drinking practices at work places, reheating cooked food, mode of transmission of AIDS and cross contamination which could be because of low education status of the food handlers working in rural settings.

The responses of the food handler for (Questions 13 to 21, Table 2) framed to assess the adequacy of knowledge regarding preventive measures for food hygiene revealed that the average score was 75% while other researchers have reported a comparatively lower level of awareness among their study participants. It was also observed that the food handlers had inadequate knowledge on proper cleaning and sanitisation of utensils risk related to advance preparation of food and correct temperature for food storage. Adequate temperature in cooking and storage of foods is important to minimise the growth of bacteria and the food that cannot be maintained within the safety temperature zone may act as incubator for the pathogenic bacteria whether the food is raw, partially cook or fully done.^{10,13} Isolation of pathogenic organisms such as Hepatitis A, faecal coliform and Staphylococcus aureus have been from vended food^{12,13} clearly indicates that adequate food safety measures should be taken to inhibit the transmission of pathogenic bacteria via food.

Conclusion

In general, food-handlers in food establishments at Saifai developmental block, had satisfactory knowledge in the areas of food safety, general and personal hygiene, cleaning and sanitation procedures. However, this did not translate into strict food hygiene practices. Therefore continuous food safety education and motivation for food-handlers of various demographic backgrounds with special attention paid to those with lower levels of education would complement

other interventions that pursue the enhancement of food safety systems in Saifai. The routine medical examination of food handlers must be carried by health officers in the development of strategic plans towards regulating safe street food handling, preparation and vending.

Source of Funding: None

Conflict of Interest: None

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